

REMARKS

Applicant amended the abstract to address an objection, and claims 1, 10, and 17-19. Claims 1-19, of which claims 1, 10, 18 and 19 are independent form, are presented for examination.

The claims are directed to compositions having, among other things, a photoinitiating system. The photoinitiating system can comprise 0.5-1.5% by weight of an aromatic ketone photoinitiator and 3-8% by weight of a second photoinitiator capable of undergoing alpha cleavage, or 2-4% by weight of an aromatic ketone photoinitiator and 5-10% by weight of a second photoinitiator capable of undergoing alpha cleavage. As described in Applicant's specification (e.g., Examples 1 and 2), ink compositions having the claimed photoinitiating systems offer good performance in that they are durable and can be cured at high speeds (e.g., up to 650 ft/min).

Claims 1-19 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. With regard to the independent claims, no clear difference was seen between the claimed "aromatic ketone" and the claimed "alpha-cleavage" photoinitiators. Claim 17 is rejected for lack of antecedent basis. Applicant amended the independent claims and claim 17 to obviate this rejection, and requests that the rejection be withdrawn.

Claims 1-19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over WO 99/54416 (Caiger). The Office Action notes that Caiger discloses compositions having one or more photoinitiators in a total concentration of from 1% to 15%, and mentions (in Example 4) a composition having an alpha-cleavage photoinitiator as claimed. The Action then concludes that it would have obvious to not only use this amount of alpha-cleavage photoinitiator but to also increase the amount of the photoinitiator. However, there is no suggestion to modify Caiger's compositions as proposed to arrive at the combination of materials that make up the claimed photoinitiating system.

As the Action correctly notes, Caiger does indicate (once in Example 4) that an ink composition can include 3% by weight of an alpha-cleavage photoinitiator, but Caiger also indicates in Example 4 that the composition includes 3% by weight of an aromatic ketone

photoinitiator (4-phenyl benzophenone). That is, Caiger's 3% by weight amount of the aromatic ketone photoinitiator is outside the range of 0.5-1.5% by weight of the aromatic ketone photoinitiator, as recited in claims 1 and 18. And there is no suggestion to reduce the amount of the aromatic ketone photoinitiator in Example 4. When Caiger does reduce the amount of the aromatic ketone photoinitiator (as in Examples 1-3 and 5-8), Caiger also reduces the amount of the alpha-cleavage photoinitiator to outside the claimed ranges. Thus, nowhere does Caiger suggest an ink composition having 0.5-1.5% by weight of an aromatic ketone photoinitiator and 3-8% by weight of a second photoinitiator capable of undergoing alpha cleavage, as recited in claims 1 and 18. Even further removed, Caiger nowhere discloses or suggests a composition having 2-4% by weight of an aromatic ketone photoinitiator and 5-10% by weight of a second photoinitiator capable of undergoing alpha cleavage, as recited in claims 10 and 19. As indicated above and in Applicant's specification, ink compositions having the claimed photoinitiating systems are durable and curable at high speeds.

Furthermore, within the range of 1% to 15% of one or more photoinitiators, Caiger provides no general guidance as to how much of one photoinitiator to use relative to another photoinitiator. That is, for its multi-component photoinitiating system, Caiger provides no teaching of the relationships between the amounts of the materials that compose the photoinitiating system. The Office Action conclusorily states that it would have been obvious to increase the amount of alpha-cleavage photoinitiator from 3% by weight (presumably to the claimed 3-8% or 5-10% ranges) to increase the amount of free radical initiating moieties in the composition. But as the Action also states (on page 2), certain aromatic ketone photoinitiators (such as substituted benzophenones) in combination with an amine synergist can also generate a radical. Thus, assuming *arguendo* that it is desirable to increase the amount of free radical initiating moieties, a similar result could as easily be achieved by holding to 3% or reducing the amount of alpha-cleavage photoinitiator, and increasing the amount of aromatic ketone photoinitiator, e.g., outside of the claimed range. Instead, it appears from Caiger's other examples that the amount of the alpha-cleavage photoinitiator should be 1% or less, and the amount of the aromatic ketone photoinitiator should be 2% or less. Since Caiger provides no

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clear guidance to adjust the amounts of photoinitiators as proposed in the Action, and as explained above, there are multiple approaches to achieve the motivation or goal proposed by the Action, Applicant submits that the Action has improperly arrived at the claimed composition by using Applicant's claim as a template, guided by hindsight analysis. Absent a valid motivation to modify Caiger's composition to arrive at the claimed compositions, Applicant submits that the Action is applying an obvious-to-try standard, which is of course improper.


In light of the above remarks, Applicants submit that the claims are patentable over Caiger and request that the rejection be reconsidered and withdrawn.

Applicant believes the claims are in condition for allowance, which action is requested.

Enclosed is a Petition for Extension of Time with the required fee. Please apply any other charges or credits to deposit account 06-1050.

Respectfully submitted,

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Abstract (Amended)
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Radiation-curable ink compositions and methods of printing including the compositions are disclosed. In some embodiments, a radiation-curable hot melt ink composition includes a colorant, a polymerizable monomer, and a photoinitiating system. The photoinitiating system can include 0.5-1.5% by weight of an aromatic ketone photoinitiator, 2-10% by weight of an amine synergist, 3-8% by weight of an alpha-cleavage type photoinitiator, and 0.5-1.5% by weight of a photosensitizer.

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I hereby certify under 37 CFR §1.8(a) that this correspondence is being deposited with the United States Postal Service as first class mail with sufficient postage on the date indicated below and is addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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